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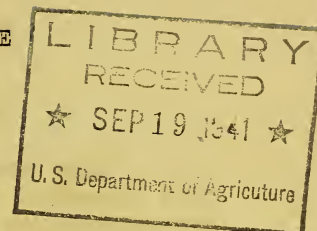
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UNITED STATES DEPARTMENT OF AGRICULTURE

U.S. Agricultural Marketing Service

Washington, D. C.



LABELING OF SODIUM HYPOCHLORITE SOLUTIONS RECOMMENDED
FOR USE AS DISINFECTANTS

Sodium hypochlorite solutions recommended for use as disinfectants are subject to the provisions of the Federal Insecticide Act if shipped in interstate commerce, exported from or imported into the United States, or sold in the District of Columbia or any territory of the United States. The attention of manufacturers is directed particularly to section 8 of this act for information about the ingredient statement which must appear on the labels of insecticides and fungicides (including disinfectants) and to the provision that they shall bear no statement, design, or device which is false or misleading in any particular.

Ingredient Statement

Commercial sodium hypochlorite solutions usually consist of slightly alkaline aqueous solutions of sodium hypochlorite together with sodium chloride and small amounts of sodium hydroxide and impurities, such as sodium carbonate, sodium bicarbonate, and calcium salts. In such preparations the sodium hypochlorite (NaOCl) is considered active and the remainder of the preparation is inert. The following, which should appear on the front or main panel of the label in type and position sufficiently prominent to attract the immediate attention of the purchaser, is the most feasible form of ingredient statement to comply with the requirements of section 8:

Active ingredient

Sodium hypochlorite ----%

Inert ingredients ----%

Total.....100%

the correct percentages being given.

The small amount of sodium hydroxide occurring in ordinary sodium hypochlorite solutions actually reduces their germicidal power. This appears to be due to the fact that the excess alkali stabilizes the sodium hypochlorite so that the oxidizing power, commonly expressed in terms of "available chlorine," is less readily capable of acting, thus rendering the product less effective as a disinfectant. In view of this, sodium hydroxide in such preparations is inert within the meaning of the act.

Deterioration of Sodium Hypochlorite Solutions

These preparations deteriorate on standing, the rate of deterioration depending on the composition of the product, the type of container, the temperature of storage, and possibly other factors. Usually they contain some excess alkali to aid in stabilizing them, but this does not completely stop their decomposition, although it may retard it.

The manufacturer's attention is directed to the fact that the preparation, having been shipped in interstate commerce, remains subject to provisions of the act as long as it remains unloaded, unsold, or in the original unbroken packages. It is the intention of the act that the information contained on the label shall be correct at the time that the product comes into the hands of the consumer. Therefore, the manufacturer should determine the stability of his product and should then label it and market it in such a way that the purchaser will not be misled.

Effect of Organic Matter on Sodium Hypochlorite Solutions

In the presence of most forms of organic matter the bactericidal efficiency of these preparations is very markedly decreased or even entirely dissipated. This is because the sodium hypochlorite may be rapidly used up in oxidizing the organic matter, leaving an insufficient concentration of it to be effective as a germicide. The directions for use of such a preparation as a disinfectant should always make it clear that the preparation should be applied only to clean surfaces. Recommendations for disinfecting dairy utensils, milking machines, dishes, sickroom utensils, and similar objects should always bear directions that the articles to be disinfected should be thoroughly cleaned before applying the disinfectant.

Phenol Coefficient Statements Misleading

A statement on the label of a sodium hypochlorite solution that it has a phenol coefficient of 3, for example, would mean that it was 3 times as powerful as a germicide against Bacillus typhosus as phenol under conditions of the test used. The ordinary purchaser might well believe from this that it would be 3 times as efficient as a germicide under any or all conditions. This, of course, is not true. In the absence of organic matter, as for example in good drinking water, this same sodium hypochlorite would be many times more powerful than phenol as a disinfectant. On the other hand, when used in the presence of large quantities of organic matter it would be much less effective than phenol. Since phenol coefficients as applied to this type of preparation are likely to be misleading, such statements should not appear on their labels.

Poisonous Properties of Sodium Hypochlorite Solutions

Sodium hypochlorite preparations containing 10 percent or more of "available chlorine" are subject to the provisions of the Federal Caustic Poison Act if shipped in interstate commerce in packages suitable for household use and must bear the poison labeling required by the act. The usual commercial preparations contain less than 10 percent of "available chlorine" and, therefore, are not subject to the Federal Caustic Poison Act and do not require the word "poison" on the label. However, they should not be labeled as "non-toxic," "non-poisonous," nor "non-injurious," since they will not be nonpoisonous under all conditions of use. There would be no objection to a statement, such as "non-poisonous when used as directed," provided the directions were such that this is true.

Broad and Misleading Claims

While sodium hypochlorite solutions are effective as disinfectants or germicides in the absence of organic matter, they cannot be depended upon to kill all germs, including spores. Therefore, claims to sterilize or to kill all germs, and unmodified claims, such as "kills germs" or "destroys bacteria" or similar broad claims, are objectionable.

Dilutions of Sodium Hypochlorite Solutions To Be Recommended

The manufacturer is responsible for all efficacy claims on his label, and all such claims should be based on the results of adequate tests. As already indicated, the effectiveness of sodium hypochlorite solutions for disinfecting depends on the concentration of the sodium hypochlorite, the alkalinity of the solution, and the amount of organic matter present. It is, therefore, impossible to give general directions which will be applicable under all conditions of use.

In case of disinfecting clean dairy equipment, sick room utensils, dishes, and similar articles, a dilution containing 200 parts per million of "available chlorine" should be effective. That is, if the preparation contains 2 percent of "available chlorine," it may be recommended for such use in a dilution of 1 to 100; if it contains 4 percent, it may be recommended at a dilution of 1 to 200; and other strengths in proportion.

Under conditions where the tests outlined in the Milk Control Code of the United States Public Health Service are applied to make certain that the solution will not be too much weakened in use, no objection will be raised to the recommendation of a dilution containing a minimum of 100 parts per million of "available chlorine" for disinfecting clean dairy utensils. This would be equivalent to a dilution of 1 to 200 for a solution containing 2 percent of "available chlorine" or 1 to 400 for one containing 4 percent of "available chlorine." Such recommendation should always be accompanied by a warning that the strength of the disinfectant should not be allowed to fall below 50 parts of "available chlorine" per million at any time during use. (The percentage of sodium hypochlorite multiplied by the factor 0.952 gives the percentage of so-called "available chlorine".)

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Method and Time Necessary for Disinfection

Sodium hypochlorite solutions are effective as disinfectants only when they completely wet the object to be disinfected and remain in contact for a sufficient length of time. In the case of dairy utensils no objection will be raised to an allowance of 2 minutes for the disinfecting period, as suggested by the Milk Control Code, and for dishes, sick room utensils, etc., a period of at least 5 minutes should be recommended. As previously mentioned, the label should always bear directions that the articles to be disinfected be thoroughly cleaned before application of the disinfectant. Any label which bears directions for disinfection by sprinkling (which will not wet all surfaces), by fumigation, by exposure on cloths dampened with it, or by any similar procedure will, of course, be objectionable.

C. C. McDonnell,
In Charge, Insecticide Division

March 12, 1930.

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